Believe me: Interpreting direct objects of attitude verbs

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1   The puzzle

Anti-rogative predicates (those predicates which can take declarative but not interrogative complements like *believe* and *think*) are a heterogeneous bunch.

Some anti-rogatives can also take 'content DPs', or DPs which can have propositional complements, as DOs (Vendler 1972, Ginzburg 1995, Uegaki 2016, Elliott 2019, a.m.o.):

(1)   a.   Mabel {believes/trusts/understands/accepts/denies} that Marianne can combat the dark psychic forces.
       b.   Mabel {believes/trusts/understands/accepts/denies} the {rumor/claim/assertion} (that Marianne can combat the dark psychic forces).

Many predicates of this kind can also take DPs which **don't** allow propositional complements.

For instance, *believe* and *trust* may take DPs which appear to stand in for a **claim**[1]. in such cases, the DP can be paraphrased as *DP's claim*:

(2)   Mabel believes/trusts Marianne/the book. ≈ Mabel believes/trusts Marianne's/the book's claim.

The DP in such cases either refer to a sentient individual (*the acrobat; Constance*) or a or a 'repository of propositional information' (*the book; the sign*) (Anand & Hacquard 2009, 2014)

But! Some verbs which permit objects like *Marianne* and *the book* do not have this same paraphrase:

(3)   Mabel denies/accepts Marianne/the book. ≉ Mabel denies/accepts Marianne's/the book's claim.

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[1]Roughly construed; to be elaborated.

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And of course, some declarative embedders don't allow DP complements at all:[2]

(4)   *Mabel thinks/supposes Marianne/the book.

Question 1: What is the interpretation of objects like that in (3), and why?
Question 2: What factors account for the differences between verbs in (2)-(4)?

Today

- Addressing question 1: pinning down the meaning of *believe DP* and deriving it compositionally, while raising problems this generates

- Very high-level progress towards question 2

2   The empirical landscape

It's not enough for the relevant DP to 'contain' propositional content, it must (in some sense) *assert* that content.

This is a special feature of *believe DP*; the existence of an assertion is **not** a requirement of *believe/trust CP*, however:

(5)   I believe that it's raining. (Said after seeing a coworker enter the office with an umbrella)

2.1   The 'assertive' requirement

One necessary condition of *believe/trust DP*: the DP must embody an 'assertion' in some sense.

(6)   **Context:** Aloysius reads a transcript of witness testimony from a recent trial, although he wasn't there in person. He finds their testimony credible and compelling.
    a.   Aloysius believes/trusts the witness.
    b.   #Aloysius believes/trusts the transcript.

While (4b) is interpretable, it means that Aloysius believes *that the transcript is a faithful representation of the testimony*.

(7)   **Context:** Quentin finds Zinnia's diary after her death. In it, she confesses to robbing a bank. Quentin realizes this confession must be true.
    a.   Quentin believes/trusts Zinnia.
    b.   Quentin believes/trusts Zinnia's diary.

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[2]I leave aside here cases like *I think that* or *I think everything that John thinks*.

The characterization of these objects as 'assertive' is not *quite* nuanced enough. We may also *believe* things which are depictive, such as pictures and recordings:

(8)   **Context**: A discussion of Steve Jobs, who apparently was an audiophile in his youth.[3]

      A: Could you point me to the passage that says [Steve] never owned a quality hi-fi? I'm left hanging between that assertion and the evidence in the photograph from his bachelor days, along with stuff early in this thread about the high-end gear that he bought from David Wilson, etc.

      B: [D]o you **believe the photograph** or the assertion?

(9)   Why would ANYONE **believe the transcript** or the whistleblower report handed over by the WH?

(10)   Everything would be exactly the same because either nobody would **believe the footage** or, worse, nobody would care.

Depictive artifacts are not understood as making a claim *per se*, but rather providing an **accurate depiction of reality**.

The intuition here is that *believe* compares the content of something to some external veridical standard.

2.2   The sourcehood requirement

There also seems to be a soft preference that the DP in question be the most immediate source of the subject's belief.

(11)   **Context**: Anders told Beryl he had a vision that the world will end next week.
Beryl, the next day, says to Charlene: 'Anders said that the world will end next week. You should begin stockpiling.' Charlene takes Beryl's word for it.

    a.   Charlene believes that the world will end next week.

    b. ?Charlene believes Anders.

    c.   Charlene believes Beryl that Anders said that the world will end next week.

    d. #Charlene believes Beryl that the world will end next week.

2.3   The awareness requirement

It's not enough for the assertion to exist; the subject must also be aware of it. This requirement persists under negation, modals, and in PQs, suggesting this awareness is presupposed.

(12)   **Context**: Anders is at it again, going around telling people that the world will end tomorrow. Beryl hasn't heard him say this, but she independently thinks that the apoca-

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[3]`https://forums.stevehoffman.tv/threads/steve-jobs-was-an-audiophile.270984/page-3`

lypse is tomorrow.
a. Beryl believes that the world will end tomorrow.
b. #Beryl believes Anders.
c. #Beryl doesn't believe Anders.
d. #Does Beryl believe Anders?
e. #Maybe Beryl believes Anders.

Finally, it seems the AH's attitude must be *because of* the assertion in question:

(13) **Context**: Today Anders has been going around telling people that the world will end next week. Beryl, who already thinks the world will end next week, hears one of his sermons. She nods in agreement.
a. Beryl believes that the world will end tomorrow.
b. #Beryl believes Anders.

2.4 Combining sources and content

Finally, in English, both the assertor and the assertion can be overt, and at least one of the two must be:

(14) a. Frida believes Diego that the Communists will win.
b. The princess trusts her handmaiden that the poisoner will be summarily punished.

(15) *Frida believes/trusts.

This is also true with the Estonian confederates of *believe* and *trust*, the etymologically related *uskuma* and *usaldama*:

(16) a. Tiit usub/usaldab Liisi, et   koroonaviirus on ohtlik.
Tiit believes/trusts Liis   that coronavirus   is dangerous.
'Tiit believes/trusts Liis that coronavirus is dangerous.'
b. Tiit usub/usaldab Liisi.
c. Tiit usub/usaldab, et koroonaviirus on ohtlik.
d. *Tiit usub/usaldab.

While I don't yet know of a language that disallows *believe DP*, the possibility of overtly expressing the CP is not universal, even among head-initial languages:

(17) Marine croit   Gaston (*qu' il a   cambriolé une banque).
Marine believes Gaston that   he has robbed   a   bank
'Marine believes Gaston (*that he robbed a bank).'   French[4]
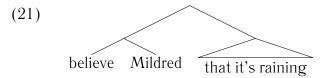

2.5 Constituency

Unlike with content DP objects, clearly assertive object and CP do not form a constituent:

(18)   A: What/who does Hobart believe?
        B: {*Mildred/*the book/✓the rumor} that it's raining.   *Fragment Answer*

(19)   *It is *Mildred/*the book/✓the rumor that it's raining that Hobart believes.   *Clefting*

(20)   *Mildred/*the book/✓the rumor that it's raining is what Hobart believes.   *Pseudo-clefting*

This is suggestive of a syntactic difference between *rumor-* and *book*-type objects of *believe*.

Instead, we might suppose that *believe* composes first with the DO, then the CP:

(21)

believe   Mildred   that it's raining

3 Analysis

Desiderata for the interpretation of *believe DP* with an assertive object:

- A presupposition that the DP made a claim with particular (propositional) content, and the subject of *believe* is aware of that claim

- The subject believes this content on the basis of that claim.

3.1 Semantic denotations

I assume, following Hintikka (1962, 1975, *et seq.*), that *believe* contributes universal quantification over worlds in the subject's belief state:

(22) $[\![\textbf{believe}]\!]^w = \lambda p_{st}.\lambda x_e.\text{DOX}_x^w \subseteq p$

If *believe* selects a proposition (type st), it cannot directly compose with a DP like *the book* or *Mildred*, which are assumed to be individuals (type e).

I follow Uegaki (2016) and others in assuming that DP complements of *believe* can be type-shifted into the right kind of argument for composition.

Specifically, I posit that the assertive DO combines with the silent operator CLAIM, which contributes a presupposition as follows (underlined):

(23) $[\![\text{CLAIM}]\!]^w = \lambda x_e.\lambda p_{st}.\exists e_v[\mathbf{claim}(e)(x) \wedge \mathscr{F}_{cont}(e) \subseteq p]^5$

where $\mathscr{F}_{cont}$ is a metalanguage function that returns the propositional content of a situation (see Hacquard 2006).

Breaking this down:

- CLAIM DP contributes a proposition that there was a claiming event, made by the entity denoted by the DP

- This event has propositional content which entails a particular proposition p

3.2   How the composition might proceed

Given the linear order V–DP–CP and a basic syntax as discussed in §2.6, I am going to assume that the V first composes with the direct object, then the contentful CP.

Case 1: With an overt CP

Although *believe* and CLAIM DP are both functions of propositions, the nominal argument of *believe* can composes with the verb the operation *Restrict* (Chung & Ladusaw 2004).

This operation can restrict the outer argument of *believe* without saturation:

(24)   For type α and type β such that $\beta = \langle \beta_1 \langle ... \langle \beta_n t \rangle \rangle \rangle$ for some $n \geqslant 0$,
        $Restrict(A_{\langle \alpha\beta \rangle}, B_{\langle \alpha t \rangle}) = \lambda x \in D_\alpha.\lambda y_1 \in D_\beta ... \lambda y_n \in D_\beta.A(x)(y_1)...(y_n) \wedge B(x)$
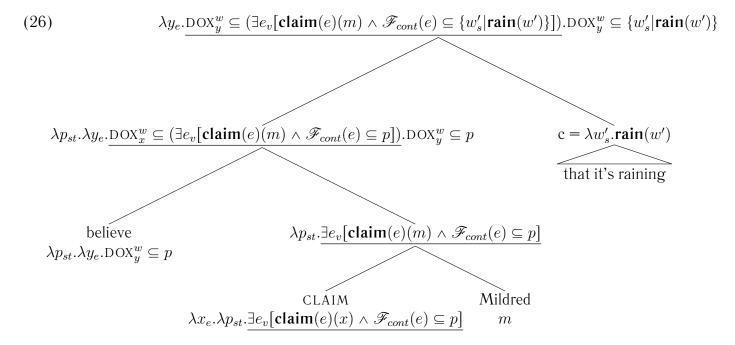
The derivation proceeds as follows:

1. CLAIM composes with the nominal DP by Function Application.

2. The resultant CLAIM+DP composes with *believe* by Restrict.

3. Finally, the embedded CP argument composes with the rest of the VP again by FA.

I further assume that presuppositions in the scope of *believe* project to the attitude holder's belief state (Karttunen 1974).

(25)   believe [CLAIM [Mildred]] that it's raining

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[5]There are in principle may ways of formalizing this, including without event semantics. Nothing crucial, to my knowledge, hangs upon the particular choice employed here.

(26)

$$\lambda y_e.\underline{\mathrm{DOX}_y^w \subseteq (\exists e_v[\mathbf{claim}(e)(m) \wedge \mathscr{F}_{cont}(e) \subseteq \{w'_s|\mathbf{rain}(w')\}])}.\mathrm{DOX}_y^w \subseteq \{w'_s|\mathbf{rain}(w')\}$$

$$\lambda p_{st}.\lambda y_e.\underline{\mathrm{DOX}_x^w \subseteq (\exists e_v[\mathbf{claim}(e)(m) \wedge \mathscr{F}_{cont}(e) \subseteq p])}.\mathrm{DOX}_y^w \subseteq p \qquad\qquad c = \lambda w'_s.\mathbf{rain}(w')$$

that it's raining

believe
$$\lambda p_{st}.\lambda y_e.\mathrm{DOX}_y^w \subseteq p \qquad\qquad \lambda p_{st}.\exists e_v[\mathbf{claim}(e)(m) \wedge \mathscr{F}_{cont}(e) \subseteq p]$$

CLAIM $\qquad\qquad$ Mildred
$$\lambda x_e.\lambda p_{st}.\underline{\exists e_v[\mathbf{claim}(e)(x) \wedge \mathscr{F}_{cont}(e) \subseteq p]} \qquad\qquad m$$

This achieves the desired results: we presuppose that the subject believes that Mildred made a particular claim (namely that it is raining), and assert that that subject believes that it is raining.

Case 2: No overt CP

When *believe* takes only an assertive DP, it must be recoverable from context what the content of the DP's claim was.

(27)   Hobart believes Mildred. (infelicitous out of the blue)

The propositional argument of *believe* here seems **implicit**.

There are at least two kinds of implicit arguments: those that receive existential interpretations (like objects of *eat*), and those that receive anaphoric interpretations (like objects of *apply*).

Believe behaves more like the latter than the former; (26) can't simply mean that H believes something that M claimed.

(28)   There was a good job available here but Fred didn't apply.   (Condoravdi & Gawron 1996: 3)

(29)   Mildred told Hobart that pigs could fly and he believed her.

We might then take an account of anaphoric implicit arguments off the shelf and apply it here, but for one hangup: *believe* must be followed by **something**:

(30)   Mildred told Hobart that pigs could fly and he believed *(her/it/that).

I don't yet have an account of this.

4   Comparison to a neo-Davidsonian approach

The flexible embedding behavior of *believe* and *trust* is reminiscent of neo-Davidsonian approaches to verb meaning[6]

The main idea here: verbs are predicates of eventualities, and thematic arguments are incorporated via metalanguage functions.
It's not surprising they can compose with all sorts of things (Kratzer 2006, Moulton 2009, 2015, a.o.)

For instance in a Kratzer/Moulton-style account, *believe* takes two arguments: an eventuality and a content argument:

(31) $\lambda e_v.\lambda s.\textbf{believe}(e)(s)$

The content argument (s) can be saturated by DPs or CPs that denote the sorts of things that can be believed.

Under this view, lexical verbs have relatively bleached meanings, and *that*-clauses denote predicates of contentful individuals (type $\langle e, \alpha \rangle$) which compose with V through Predicate Modification.

This is a useful way of thinking about *that*-clauses which can compose with content nominals like *rumor* and *idea*, which do not take propositional arguments.

4.1   How might we handle assertive DPs?

An object DP could presumably modify the content argument of *believe* in the ways described in §3.

While this seems promising in principle, there is one issue: *believe* intuitively conveys some notion of doxastic alternatives.

Kratzer proposes a somewhat unorthodox division of labor: these alternatives come from a *that*-clause or a nominal like *rumor*, rather than the verb.

However, it's not at all clear how one might account for this in *believe DP* cases...

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[6]See Elliott (2019) for an extended defense of this approach.

...or leverage this to account for verbs which permit assertive objects and which do not.

→ A significant amount of work must be done by the lexical semantics of the verbs.

5 Differences between verbs

A chief realization:

- We need the presupposition(s) associated with *believe DP* to come **from the DP**, since they're not present in *believe CP* cases

- The ability for this presupposition to occur is limited by the lexical semantics **of the embedding verb**

These aren't necessarily incompatible, but we should seek an explanation for why not all verbs permit assertive DPs.

5.1 Which verbs take assertive DPs

The verbs which permit assertive DPs appear to have some broad semantic classes:

- Verbs of (anti-)credulity: *believe*, *trust*, *challenge*, *dispute*...

- Verbs of (anti-)comprehension: *(mis)understand*, *get*, *comprehend*, *grok*...

- Verbs of (anti-)validation: *fact-check*, *corroborate*, *confirm*, *contradict*...

<u>Tentative semantic generalization</u>: These verbs all convey some notion of comparing the truth of a proposition to some standard

Still an open question: is this a key ingredient for assertive-DP embedding in the lexical semantics of these verbs? How should it be formalized?

6 Parting thoughts

Some upshots:

- **Not all DPs are the same**: There is clearly semantic flexibility in string-identical objects of attitudes

    - ...even propositional DPs are not a uniform class

- We need a finer-grained notion of selection than syntactic category/semantic type to account for verbs which allow different kinds of proposition-like DPs

- 'Selectional' restrictions can be obviated in the right contexts

Some puzzles that remain to be solved:

- Can we account for verbs which don't allow DPs at all without appealing to syntactic selection?

- How does *believe* differ between languages that allow *believe DP CP* sequences, like English, versus those that don't, like French?

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